

Appl. No. 09/818,263
Amdt. Dated October 14, 2004
Reply to Office Action of June 14, 2004

Attorney Docket No. 81751.0011
Customer No. 26021

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A liquid crystal device, comprising:

M rows of scanning lines, wherein M is an integer equal to or greater than 2, and N columns of data lines, wherein N is an integer equal to or greater than 2;

M X N number of switching element respectively connected to one of the M rows of scanning lines and one of the N columns of data lines;

M X N number of pixel electrodes respectively connected to one of the M X N number of switching element;

M rows of opposite electrodes arranged oppositely to respective rows of the M X N number of pixel electrodes through a liquid crystal layer;

a scanning line driving circuit configured to supply a scanning signal including a scanning period for sequentially selecting at least one of the M rows of scanning lines to the entire M rows of scanning lines in each of a plurality of subfields defined by dividing one field;

a signal control circuit configured to convert a data signal to a binary signal in each of the subfields;

a data line driving circuit configured to supply a binary voltage to the N columns of data lines based on the binary signal from the signal control circuit; and

a polarity inverting circuit configured to invert a polarity of a voltage applied to the liquid crystal layer in synchronization with the scanning

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period by changing a voltage supplied to an opposite electrode of a row corresponding to the selected scanning line in each of the subfields.

2. (Original) The liquid crystal device according to claim 1,
wherein the polarity inverting circuit inverts a voltage supplied to the opposite electrodes for the respective rows in synchronization with a beginning of the scanning period.
3. (Original) The liquid crystal device according to claim 1,
wherein the polarity inverting circuit comprises:
a memory section which holds a first electric potential or a second electric potential as an electric potential for each of the M rows of opposite electrodes, and updates the held electric potential every scanning period; and
an electric potential selecting circuit for selecting the electric potential supplied to the M rows of opposite electrodes based on the first electric potential or the second electric potential outputted from the memory section every scanning period.
4. (Original) The liquid crystal device according to claim 3,
wherein the memory section is a shift register which sequentially shifts an input signal of the first electric potential or the second electric potential.
- 5-7. (Cancelled).
8. (Previously Presented) The liquid crystal device according to claim 1,
wherein the M rows of opposite electrodes are formed by M number of rectangular electrodes formed along each of the M rows of scanning lines, and the M number of rectangular electrodes are insulated from each other.

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9. (Previously Presented) Electronic equipment comprising a liquid crystal device according to claim 1.

10. (Currently Amended) A driving device for a liquid crystal display panel, the liquid crystal display panel comprising:

M rows of scanning lines, wherein M is an integer equal to or greater than 2, and N columns of data lines, wherein N is an integer equal to or greater than 2;

M \times N number of switching elements, each said switching element connected to one of the M rows of scanning lines and one of the N columns of data lines;

M \times N number of pixel electrodes, each said pixel electrode connected to one of the switching elements; and

M rows of opposite electrodes, each said row of opposite electrodes arranged opposite one row of pixel electrodes through a liquid crystal layer, the driving device comprising:

a scanning line driving circuit operable to supply a scanning signal including a scanning period for sequentially selecting at least one of the M rows of scanning lines to the entire M rows of scanning lines in each of a plurality of subfields defined by dividing one field;

a signal control circuit operable to convert a data signal to a binary signal in each of the subfields;

a data line driving circuit operable to supply a binary voltage to the N columns of data lines based on the binary signal from the signal control circuit; and

a polarity inverting circuit operable to invert a polarity of a voltage applied to the liquid crystal layer in synchronization with the scanning

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period by changing a voltage supplied to an opposite electrode of a row corresponding to the selected scanning line in each of the subfields.

11. (Original) The driving device according to claim 10,

wherein the polarity inverting circuit inverts a voltage supplied to the opposite electrodes for the respective rows in synchronization with a beginning of the scanning period.

12. (Original) The driving device according to claim 10,

wherein the polarity inverting circuit comprises:

a memory section which holds a first electric potential or a second electric potential as an electric potential for each of the M rows of opposite electrodes, and updates the held electric potential every scanning period; and

an electric potential selecting circuit for selecting the electric potential supplied to the M rows of opposite electrodes based on the first electric potential or the second electric potential outputted from the memory section every scanning period.

13. (Original) The driving device according to claim 12,

wherein the memory section is a shift register which sequentially shifts an input signal of the first electric potential or the second electric potential.

14-17. (Cancelled).

18. (Currently Amended) A driving method, comprising:

supplying a scanning signal including a scanning period in which at least one of a plurality of scanning lines is sequentially selected, to the entire plurality of scanning lines by scanning line driving circuit lines in each of a plurality of subfields defined by dividing one field;

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converting a data signal to a binary signal by a signal control circuit in each of the subfields;

supplying a binary voltage to a plurality of pixel electrodes based on the binary signal from the signal control circuit by data line driving circuit through N columns of data lines and a plurality of switching elements connected to the at least one selected scanning line; and

by polarity inversion driving circuit, inverting a polarity of a voltage applied to the liquid crystal layer, which is formed between the pixel electrodes and the opposite electrode in synchronization with the scanning period, by changing a voltage supplied to an opposite electrode of a row corresponding to the selected scanning line in each of the subfields.

19. (Previously Presented) The liquid crystal device according to claim 1, further comprising,

a counter configured to count a vertical synchronous signal for determining the subfields,

wherein the polarity inverting circuit inverts a voltage supplied to the opposite electrodes for the respective rows based on an output from the counter.

20. (Previously Presented) The driving device according to claim 10, further comprising:

a counter operable to count a vertical synchronous signal for determining the subfields,

wherein the polarity inverting circuit inverts a voltage supplied to the opposite electrodes for the respective rows based on an output from the counter.

21. (Previously Presented) The driving method according to claim 18,

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wherein the polarity inverting circuit inverts a voltage supplied to an opposite electrode of a row corresponding to the selected scanning line based on an output from a counter which counts a vertical synchronous signal for determining the subfields.